

IN THE CLAIMS:

The status of each claim that has been introduced in the above-referenced application is set forth in the ensuing listing of the claims. This listing of the claims replaces all prior claims listings.

1. (Currently amended) A semiconductor device package, comprising:
a semiconductor die with a plurality of bond pads arranged on an active surface thereof;
a tape positioned over said the active surface, said the tape including at least one slot formed therethrough, each of said the plurality of bond pads being exposed through said the at least one slot, at least one end of said the at least one slot extending beyond an outer periphery of said the semiconductor die;
a substrate element positioned over said the tape opposite said the semiconductor die, said the substrate element including a plurality of contact areas, each contact area of said the plurality corresponding to a bond pad of said the plurality of bond pads and electrically connected thereto by way of an intermediate conductive element that extends through at least one opening formed through said the substrate element and aligned with said the at least one slot of said the tape, said the substrate element further including a contact pad in communication with each contact area of said the plurality of contact areas by way of a substantially laterally extending conductive trace;
a quantity of encapsulant material substantially filling a volume defined by said the at least one slot of said the tape and said the at least one opening of said the substrate element; and
a overlay secured to a surface of said the substrate element opposite said the tape, said the overlay substantially covering at least said the at least one opening through said the substrate element, contact pads of said the substrate element being exposed beyond or through said the overlay.

2. (Currently amended) The semiconductor device package of claim 1, wherein saidthe plurality of bond pads is arranged substantially linearly along a central region of saidthe active surface of saidthe semiconductor die.

3. (Currently amended) The semiconductor device package of claim 1, wherein saidthe tape is formed from a material having a coefficient of thermal expansion similar to a coefficient of thermal expansion of a material of saidthe semiconductor die.

4. (Currently amended) The semiconductor device package of claim 3, wherein saidthe substrate element has a coefficient of thermal expansion similar to saidthe coefficient of thermal expansion of saidthe material of saidthe semiconductor die.

5. (Currently amended) The semiconductor device package of claim 1, wherein both ends of saidthe at least one slot formed through saidthe tape extend beyond saidthe outer periphery of saidthe semiconductor die.

6. (Currently amended) The semiconductor device package of claim 1, wherein saidthe tape is adhesively secured to saidthe active surface of saidthe semiconductor die and to saidthe substrate element.

7. (Currently amended) The semiconductor device package of claim 1, wherein saidthe substrate element comprises at least one of an interposer and a carrier substrate.

8. (Currently amended) The semiconductor device package of claim 1, wherein saidthe substrate element comprises silicon.

9. (Currently amended) The semiconductor device package of claim 1, wherein saidthe quantity of encapsulant material substantially encapsulates each intermediate conductive element.

10. (Currently amended) The semiconductor device package of claim 9, wherein saidthe quantity of encapsulant material protrudes above a major plane of an exposed surface of saidthe substrate element opposite saidthe semiconductor die.

11. (Currently amended) The semiconductor device package of claim 1, wherein saidthe substrate element includes a recessed area adjacent saidthe at least one opening, each contact area of saidthe plurality of contact areas being located within saidthe recessed area.

12. (Currently amended) The semiconductor device package of claim 11, wherein saidthe quantity of encapsulant material substantially fills saidthe recessed area.

13. (Currently amended) The semiconductor device package of claim 12, wherein saidthe quantity of encapsulant material substantially encapsulates each saidthe intermediate conductive element.

14. (Currently amended) The semiconductor device package of claim 12, wherein saidthe quantity of encapsulant material does not extend substantially beyond a major plane of an exposed surface of saidthe substrate element.

15. (canceled)

16. (Currently amended) The semiconductor device package of claim 1, wherein saidthe overlay comprises a recessed area within which each intermediate conductive element is contained.

17. (Currently amended) The semiconductor device package of claim 1, wherein saidthe overlay is secured to saidthe substrate element with an adhesive material.

18. (Currently amended) The semiconductor device package of claim 17, wherein saidthe adhesive material comprises a pressure sensitive adhesive material.

19. (Canceled)

20. (Currently amended) The semiconductor device package of claim 1, further comprising discrete conductive elements protruding from at least some of saidthe contact pads.

21. (Currently amended) A semiconductor device assembly, comprising:
a semiconductor die with at least one bond pad on an active surface thereof;
a tape secured to saidthe active surface, saidthe tape including a slot formed therethrough with
saidthe at least one bond pad being exposed through saidthe slot, at least one end of
saidthe slot extending beyond an outer periphery of saidthe semiconductor die;
a substrate element positioned over saidthe semiconductor die opposite saidthe tape from saidthe
semiconductor die, saidthe substrate element including at least one opening formed
therethrough through which saidthe at least one bond pad is exposed; and
a overlay adhesively secured to a surface of saidthe substrate element opposite saidthe tape,
saidthe overlay substantially covering at least saidthe at least one opening through
saidthe substrate element.

22. (Currently amended) The assembly of claim 21, wherein saidthe semiconductor
die includes a plurality of bond pads arranged substantially linearly along a central region of
saidthe active surface.

23. (Currently amended) The assembly of claim 21, wherein saidthe tape has a similar coefficient of thermal expansion to a coefficient of thermal expansion of saidthe substrate element.

24. (Currently amended) The assembly of claim 23, wherein saidthe semiconductor die has a similar coefficient of thermal expansion to saidthe coefficient of thermal expansion of saidthe substrate element.

25. (Currently amended) The assembly of claim 21, wherein two ends of saidthe slot extend beyond saidthe outer periphery of saidthe semiconductor die.

26. (Currently amended) The assembly of claim 21, wherein saidthe at least one end of saidthe slot receives encapsulant material.

27. (Currently amended) The assembly of claim 25, wherein one of saidthe two ends of saidthe slot is positioned so as to facilitate displacement of air from saidthe slot while an encapsulant material is being introduced at least into a volume defined by saidthe slot from the other of saidthe two ends.

28. (Currently amended) The assembly of claim 21, wherein saidthe substrate element comprises at least one of an interposer and a carrier substrate.

29. (Currently amended) The assembly of claim 21, wherein saidthe substrate element includes a recessed area formed adjacent saidthe at least one opening in a surface of saidthe substrate element located opposite saidthe tape.

30. (Currently amended) The assembly of claim 29, wherein saidthe substrate element includes at least one contact area corresponding to saidthe at least one bond pad of saidthe semiconductor die.

31. (Currently amended) The assembly of claim 30, wherein saidthe at least one contact area is located within saidthe recessed area.

32. (Currently amended) The assembly of claim 31, wherein saidthe recessed area receives a portion of an intermediate conductive element that extends between saidthe at least one bond pad and saidthe at least one contact area.

33. (Currently amended) The assembly of claim 21, wherein saidthe substrate element includes at least one contact area that corresponds to saidthe at least one bond pad of saidthe semiconductor die and at least one contact pad in electrical communication with saidthe at least one contact area.

34. (Currently amended) The assembly of claim 33, further comprising at least one intermediate conductive element electrically connecting saidthe at least one bond pad to saidthe at least one contact area.

35. (Currently amended) The assembly of claim 34, wherein saidthe at least one intermediate conductive element extends through saidthe slot of saidthe tape and saidthe at least one opening of saidthe substrate element.

36. (canceled)

37. (Currently amended) The assembly of claim 21, wherein saidthe overlay includes a recessed area configured to communicate with saidthe at least one opening.

38. (Currently amended) The assembly of claim 37, wherein saidthe recessed area is configured to receive a portion of at least one intermediate conductive element electrically connecting saidthe at least one bond pad of saidthe semiconductor die to a contact area on a surface of saidthe substrate element adjacent saidthe at least one opening formed therethrough.

39. (Currently amended) The assembly of claim 21, wherein saidthe coverlay, saidthe at least one opening formed through saidthe substrate element, saidthe slot formed through saidthe tape, and saidthe semiconductor die together form a receptacle.

40. (Currently amended) The assembly of claim 39, wherein saidthe receptacle at least partially contains a quantity of encapsulant material.

41. (Currently amended) A method for packaging at least an active surface of a semiconductor die, comprising:
positioning a tape over the active surface so that at least one bond pad on the active surface is exposed through a slot formed through saidthe tape and at least one end of saidthe slot extends beyond an outer periphery of the semiconductor die;
positioning a substrate element over saidthe tape so that saidthe at least one bond pad is exposed through at least one opening formed through saidthe substrate element and aligned with saidthe slot, saidthe substrate element including at least one contact area corresponding to saidthe at least one bond pad;
electrically connecting saidthe at least one bond pad to saidthe at least one contact area;
adhesively securing a coverlay to an exposed surface of saidthe substrate element to substantially cover saidthe at least one opening formed through saidthe substrate element; and
introducing encapsulant material through saidthe at least one end into a receptacle formed by saidthe coverlay, saidthe at least one opening, saidthe slot, and saidthe semiconductor die from a location opposite the semiconductor die from saidthe tape.

42. (Currently amended) The method of claim 41, wherein said positioning said the tape comprises positioning over the semiconductor die a tape having a similar coefficient of thermal expansion to a coefficient of thermal expansion of the semiconductor die.

43. (Currently amended) The method of claim 42, wherein said positioning said the substrate element comprises positioning over said the tape a substrate element having a similar coefficient of thermal expansion to said the coefficient of thermal expansion of the semiconductor die.

44. (Currently amended) The method of claim 43, wherein said positioning said the substrate element comprises positioning a substrate element comprising silicon over said the tape.

45. (Currently amended) The method of claim 41, wherein said positioning said the tape comprises orienting said the slot with another end thereof extending laterally beyond said the outer periphery of the semiconductor die.

46. (Currently amended) The method of claim 41, further including securing said the tape to the active surface of the semiconductor die.

47. (Currently amended) The method of claim 46, wherein said securing comprises adhering said the tape to the active surface.

48. (Currently amended) The method of claim 41, wherein said positioning said the substrate element comprises positioning at least one of an interposer and a carrier substrate over said the tape.

49. (Currently amended) The method of claim 41, wherein said positioning said the substrate element comprises positioning over said the tape a substrate element comprising a recessed area adjacent said the at least one opening and including therein said the at least one contact area.

50. (Currently amended) The method of claim 49, wherein said introducing comprises introducing a portion of said the encapsulant material into said the recessed area.

51. (Currently amended) The method of claim 41, wherein said electrically connecting comprises connecting at least one intermediate conductive element between said the at least one bond pad and said the at least one contact area.

52. (Currently amended) The method of claim 51, wherein said connecting said the at least one intermediate conductive element comprises wire bonding.

53. (Currently amended) The method of claim 51, wherein said connecting said the at least one intermediate conductive element comprises extending said the at least one intermediate conductive element through said the slot formed through said the tape and said the at least one opening formed through said the substrate element.

54. (Currently amended) The method of claim 41, wherein said positioning said the overlay comprises positioning over said the substrate element a overlay including a recessed area alignable over said the at least one opening and over intermediate conductive elements extending through said the at least one opening.

55. (Currently amended) The method of claim 41, further including securing said the substrate element to said the tape.

56. (Currently amended) The method of claim 55, wherein said securing comprises adhesively securing saidthe substrate element to saidthe tape.

57. (canceled)

58. (Currently amended) The method of claim 41, wherein said adhesively securing comprises securing saidthe coverlay to saidthe substrate element with a pressure sensitive adhesive.

59. (Currently amended) The method of claim 58, wherein said adhesively securing comprises removably securing saidthe coverlay to saidthe substrate element.

60. (Currently amended) The method of claim 41, wherein said introducing comprises substantially filling saidthe slot formed through saidthe tape and saidthe at least one opening formed through saidthe substrate element with saidthe encapsulant material.

61. (Currently amended) The method of claim 41, wherein said introducing comprises substantially encapsulating at least one intermediate conductive element electrically connecting saidthe at least one bond pad to saidthe at least one contact area.

62. (Currently amended) The method of claim 41, wherein said positioning saidthe coverlay comprises forming saidthe receptacle, including saidthe slot and saidthe at least one opening, within which saidthe at least one bond pad is located.

63. (Currently amended) A method for preparing a semiconductor die for packaging, comprising:
positioning a tape over at least an active surface of the semiconductor die, saidthe tape including a slot through which at least one bond pad on the active surface of the semiconductor die

is exposed, at least a portion of saidthe slot extending laterally beyond an outer periphery of the semiconductor die;
positioning a substrate element over saidthe tape with at least one opening formed through saidthe substrate element being located at least partially over saidthe slot; and adhesively securing a overlay to saidthe substrate element to substantially seal saidthe at least one opening, saidthe overlay and lateral edges of saidthe at least one opening and saidthe slot forming a receptacle.

64. (Currently amended) The method of claim 63, further comprising electrically connecting saidthe at least one bond pad to at least one contact area located on a surface of saidthe substrate element opposite saidthe tape, proximate saidthe at least one opening.

65. (Currently amended) The method of claim 64, wherein said electrically connecting comprises connecting at least one intermediate conductive element between saidthe at least one bond pad and saidthe at least one contact area.

66. (Currently amended) The method of claim 65, wherein said connecting saidthe at least one intermediate conductive element comprises positioning saidthe at least one intermediate conductive element at least partially within saidthe slot and saidthe at least one opening.

67. (Currently amended) The method of claim 63, wherein said positioning saidthe tape comprises positioning a tape having a coefficient of thermal expansion similar to a coefficient of thermal expansion of the semiconductor die.

68. (Currently amended) The method of claim 67, wherein said positioning saidthe substrate element comprises positioning over saidthe tape a substrate element having a coefficient of thermal expansion similar to saidthe coefficient of thermal expansion of the semiconductor die.

69. (Currently amended) The method of claim 63, wherein said positioning saidthe tape comprises positioning saidthe tape with at least two regions of saidthe slot extending laterally beyond saidthe outer periphery of the semiconductor die.

70. (Currently amended) The method of claim 63, further comprising securing saidthe tape to the active surface of the semiconductor die.

71. (Currently amended) The method of claim 70, wherein said securing comprises adhesively securing saidthe tape to the active surface of the semiconductor die.

72. (Currently amended) The method of claim 64, wherein said positioning saidthe substrate element comprises positioning over saidthe tape a substrate element including a recessed area adjacent at least a portion of an edge of saidthe at least one opening, saidthe at least one contact area being located within saidthe recessed area.

73. (Currently amended) The method of claim 63, wherein said positioning saidthe substrate element comprises positioning over saidthe tape a substrate element comprising at least one of an interposer and a carrier substrate.

74. (Currently amended) The method of claim 63, further comprising securing saidthe substrate element to saidthe tape.

75. (Currently amended) The method of claim 74, wherein said securing comprises adhesively securing saidthe substrate element to saidthe tape.

76. (Currently amended) The method of claim 63, wherein said positioning saidthe overlay comprises positioning over saidthe substrate element a overlay comprising a recess

formed therein, saidthe recess being positioned so as to communicate with saidthe at least one opening formed through saidthe substrate element when said positioning is effected.

77. (canceled)

78. (Currently amended) The method of claim 63, wherein said adhesively securing comprises adhesively securing saidthe overlay to saidthe substrate element with a pressure sensitive adhesive.

79. (Currently amended) The method of claim 63, wherein said securing comprises removably securing saidthe overlay to saidthe substrate element.

80. (Currently amended) A semiconductor device package, comprising:
a semiconductor die with a plurality of bond pads arranged on an active surface thereof;
a tape positioned over saidthe active surface, saidthe tape including at least one slot formed therethrough, each of saidthe plurality of bond pads being exposed through saidthe at least one slot, at least one end of saidthe at least one slot extending beyond an outer periphery of saidthe semiconductor die;
a substrate element positioned over saidthe tape opposite saidthe semiconductor die, saidthe substrate element including a plurality of contact areas, each contact area of saidthe plurality corresponding to a bond pad of saidthe plurality of bond pads and electrically connected thereto by way of an intermediate conductive element that extends through at least one opening formed through saidthe substrate element and aligned with saidthe at least one slot of saidthe tape, saidthe substrate element further including a contact pad in communication with each contact area of saidthe plurality of contact areas by way of a substantially laterally extending conductive trace;
a quantity of encapsulant material substantially filling a volume defined by saidthe at least one slot of saidthe tape and saidthe at least one opening of saidthe substrate element; and

a overlay positioned over a surface of saidthe substrate element opposite saidthe tape, saidthe overlay substantially covering at least saidthe at least one opening through saidthe substrate element, contact pads of saidthe substrate element being exposed through or beyond saidthe overlay.

81. (Currently amended) The semiconductor device package of claim 80, wherein saidthe plurality of bond pads is arranged substantially linearly along a central region of saidthe active surface of saidthe semiconductor die.

82. (Currently amended) The semiconductor device package of claim 80, wherein saidthe tape is formed from a material having a coefficient of thermal expansion similar to a coefficient of thermal expansion of a material of saidthe semiconductor die.

83. (Currently amended) The semiconductor device package of claim 82, wherein saidthe substrate element has a coefficient of thermal expansion similar to saidthe coefficient of thermal expansion of saidthe material of saidthe semiconductor die.

84. (Currently amended) The semiconductor device package of claim 80, wherein both ends of saidthe at least one slot formed through saidthe tape extend beyond saidthe outer periphery of saidthe semiconductor die.

85. (Currently amended) The semiconductor device package of claim 80, wherein saidthe tape is adhesively secured to saidthe active surface of saidthe semiconductor die and to saidthe substrate element.

86. (Currently amended) The semiconductor device package of claim 80, wherein saidthe substrate element comprises at least one of an interposer and a carrier substrate.

87. (Currently amended) The semiconductor device package of claim 80, wherein saidthe substrate element comprises silicon.

88. (Currently amended) The semiconductor device package of claim 80, wherein saidthe quantity of encapsulant material substantially encapsulates each intermediate conductive element.

89. (Currently amended) The semiconductor device package of claim 88, wherein saidthe quantity of encapsulant material protrudes above a major plane of an exposed surface of saidthe substrate element opposite saidthe semiconductor die.

90. (Currently amended) The semiconductor device package of claim 80, wherein saidthe substrate element includes a recessed area adjacent saidthe at least one opening, each contact area of saidthe plurality of contact areas being located within saidthe recessed area.

91. (Currently amended) The semiconductor device package of claim 90, wherein saidthe quantity of encapsulant material substantially fills saidthe recessed area.

92. (Currently amended) The semiconductor device package of claim 91, wherein saidthe quantity of encapsulant material substantially encapsulates each saidthe intermediate conductive element.

93. (Currently amended) The semiconductor device package of claim 91, wherein saidthe quantity of encapsulant material does not extend substantially beyond a major plane of an exposed surface of saidthe substrate element.

94. (Currently amended) The semiconductor device package of claim 80, wherein saidthe overlay comprises a recessed area within which each intermediate conductive element is contained.

95. (Currently amended) The semiconductor device package of claim 80, wherein saidthe overlay is secured to saidthe surface of saidthe substrate element.

96. (Currently amended) The semiconductor device package of claim 95, wherein saidthe overlay is secured to saidthe surface of saidthe substrate element with an adhesive material.

97. (Currently amended) The semiconductor device package of claim 96, wherein saidthe adhesive material comprises a pressure sensitive adhesive material.

98. (Currently amended) The semiconductor device package of claim 80, further comprising discrete conductive elements protruding from at least some of saidthe contact pads.

99. (Currently amended) A method for preparing a semiconductor die for packaging, comprising:

positioning a tape over at least an active surface of the semiconductor die, saidthe tape including a slot through which at least one bond pad on the active surface of the semiconductor die is exposed, at least a portion of saidthe slot extending laterally beyond an outer periphery of the semiconductor die;

positioning a substrate element over saidthe tape with at least one opening formed through saidthe substrate element being located at least partially over saidthe slot; and

positioning a overlay over saidthe substrate element to substantially seal saidthe at least one opening, saidthe overlay and lateral edges of saidthe at least one opening and saidthe slot forming a receptacle, contact pads ~~exposed to~~ at a surface of saidthe substrate element

adjacent to which saidthe coverlay is positioned being exposed through or beyond an outer periphery of saidthe coverlay.

100. (Currently amended) The method of claim 99, further comprising electrically connecting saidthe at least one bond pad to at least one contact area located on a surface of saidthe substrate element opposite saidthe tape, proximate saidthe at least one opening.

101. (Currently amended) The method of claim 100, wherein said electrically connecting comprises connecting at least one intermediate conductive element between saidthe at least one bond pad and saidthe at least one contact area.

102. (Currently amended) The method of claim 101, wherein said connecting saidthe at least one intermediate conductive element comprises positioning saidthe at least one intermediate conductive element at least partially within saidthe slot and saidthe at least one opening.

103. (Currently amended) The method of claim 99, wherein said positioning saidthe tape comprises positioning a tape having a coefficient of thermal expansion similar to a coefficient of thermal expansion of the semiconductor die.

104. (Currently amended) The method of claim 103, wherein said positioning saidthe substrate element comprises positioning over saidthe tape a substrate element having a coefficient of thermal expansion similar to saidthe coefficient of thermal expansion of the semiconductor die.

105. (Currently amended) The method of claim 99, wherein said positioning saidthe tape comprises positioning saidthe tape with at least two regions of saidthe slot extending laterally beyond saidthe outer periphery of the semiconductor die.

106. (Currently amended) The method of claim 99, further comprising securing saidthe tape to the active surface of the semiconductor die.

107. (Currently amended) The method of claim 106, wherein said securing comprises adhesively securing saidthe tape to the active surface of the semiconductor die.

108. (Currently amended) The method of claim 100, wherein said positioning saidthe substrate element comprises positioning over saidthe tape a substrate element including a recessed area adjacent at least a portion of an edge of saidthe at least one opening, saidthe at least one contact area being located within saidthe recessed area.

109. (Currently amended) The method of claim 99, wherein said positioning saidthe substrate element comprises positioning over saidthe tape a substrate element comprising at least one of an interposer and a carrier substrate.

110. (Currently amended) The method of claim 99, further comprising securing saidthe substrate element to saidthe tape.

111. (Currently amended) The method of claim 110, wherein said securing comprises adhesively securing saidthe substrate element to saidthe tape.

112. (Currently amended) The method of claim 99, wherein said positioning saidthe overlay comprises positioning over saidthe substrate element a overlay comprising a recess formed therein, saidthe recess being positioned so as to communicate with saidthe at least one opening formed through saidthe substrate element when said positioning is effected.

113. (Currently amended) The method of claim 99, wherein ~~said~~ positioning ~~said~~ the coverlay includes securing ~~said~~ the coverlay to ~~said~~ the substrate element.

114. (Currently amended) The method of claim 113, wherein ~~said~~ securing comprises removably securing ~~said~~ the coverlay to ~~said~~ the substrate element.

115. (Currently amended) The method of claim 113, wherein ~~said~~ adhesively securing comprises removably securing ~~said~~the coverlay to ~~said~~the substrate element.

116. (Currently amended) The assembly of claim 21, wherein ~~said~~the coverlay is secured to ~~said~~the surface of ~~said~~the substrate element with an adhesive material.

117. (Currently amended) The assembly of claim 116, wherein ~~said~~the adhesive material comprises a pressure sensitive adhesive material.

118. (Currently amended) The assembly of claim 21, wherein ~~said~~the coverlay is removably secured to ~~said~~the surface of ~~said~~the substrate element.